

Claims

1 1. A self-cleaning system for delivering sanitized water or steam to
2 a dental workstation, said system comprising:

3 a water inlet which is connectable to a source of water;

4 a boiler in fluid communication with the water inlet, the boiler being
5 operable to provide steam and heat-sanitized water;

6 a sanitized water delivery line in fluid communication with the boiler;

7 a steam delivery line in fluid communication with the boiler;

8 a fluid delivery line which is connectable to the dental workstation; and

9 a diverter valve in fluid communication with the sanitized water
10 delivery line, the steam delivery line, and the fluid delivery line; said diverter
11 valve being operable to selectively establish fluid communication between the
12 fluid delivery line and the steam delivery line, or the fluid delivery line and the
13 sanitized water delivery line; whereby said fluid delivery line may be used to
14 selectively deliver sanitized water to the dental workstation, or to deliver steam
15 to said dental workstation, whereby said steam may be employed to sanitize
16 said fluid delivery line and said dental workstation.

1 2. The system of claim 1, further including a heat exchanger, said
2 heat exchanger being operable to cool the heat sanitized water provided by said
3 boiler.

1 3. The system of claim 2, wherein said heat exchanger is further
2 operable to transfer heat from said heat sanitized water to a flow of water
3 passing through said water inlet.

1 4. The system of claim 2, wherein said heat exchanger is further
2 operable to transfer heat from said heat sanitized water to a stream of air so as
3 to heat said air.

1 5. The system of claim 1, further including a sanitized water
2 reservoir in fluid communication with said boiler and with said sanitized water
3 delivery line, said reservoir being operable to store sanitized water therein.

1 6. The system of claim 1, wherein said boiler is operable to
2 provide steam at a pressure greater than atmospheric pressure.

1 7. The system of claim 6, wherein said steam pressure is employed
2 to deliver said heat sanitized water from said boiler to said sanitized water
3 delivery line, through said diverter valve, and through said fluid delivery line
4 without the assistance of a mechanical pump.

1 8. The system of claim 1, wherein said boiler further includes a
2 pressure relief valve.

1 9. The system of claim 6, wherein said boiler operates at a pressure
2 in the range of 1.5–2.0 atmospheres.

1 10. The system of claim 1, wherein said boiler is operable to
2 provide heat sanitized water at a temperature in the range of 220–240°F.

1 11. The system of claim 1, further including a temperature
2 controller in communication with the boiler, said temperature controller being
3 operable to maintain the water in the boiler at a preselected temperature.

1 12. The system of claim 1, further including a pressure controller in
2 communication with the boiler, said pressure controller being operable to
3 maintain the steam in the boiler at a preselected pressure.

1 13. The system of claim 1, further including a water conditioner in
2 fluid communication with the water inlet.

1 14. The system of claim 13, wherein said water conditioner includes
2 a water softener cartridge.

1 15. The system of claim 13, wherein said water conditioner includes
2 a water filter.

1 16. The system of claim 1, wherein said boiler is electrically heated.

1 17. The system of claim 1, wherein said boiler further includes a
2 drain line in fluid communication therewith, said drain line being separate from
3 said sanitized water delivery line.

1 18. The system of claim 1, further including a chemical agent
2 reservoir in fluid communication with the fluid delivery line, said reservoir
3 being operable to introduce a chemical composition into the fluid delivery line.

1 19. The system of claim 18, further including a steam ejector in
2 fluid communication with the steam delivery line and the chemical agent
3 reservoir, said steam ejector being operable to deliver said chemical
4 composition into the fluid delivery line when the diverter valve is actuated so
5 as to establish fluid communication between the steam delivery line and the
6 fluid delivery line.

1 20. A system for selectably delivering sanitized water or steam to a
2 workstation, said system comprising:

3 a water inlet which is connectable to a source of water;

4 a boiler in fluid communication with the water inlet, said boiler being
5 operable to provide steam and heat sanitized water;

6 a sanitized water delivery line in fluid communication with the
7 reservoir;

8 a steam delivery line in fluid communication with the boiler;
9 a fluid delivery line; and

10 a diverter valve in fluid communication with the sanitized water
11 delivery line, the steam delivery line, and the fluid delivery line; said diverter
12 valve being operable to selectively establish fluid communication between the
13 fluid delivery line and the steam delivery line, or the fluid delivery line and the
14 sanitized water delivery line; whereby said fluid delivery line may be used to
15 deliver sanitized water to the workstation or said steam may be employed to
16 sanitize said fluid delivery line.

1 21. A method for delivering sanitized water to, and cleaning biofilm
2 from, a fluid delivery line, said method comprising:

3 A. providing a fluid delivery system comprising:

4 a water inlet which is connectable to a source of water;

5 a boiler in fluid communication with the water inlet, the boiler
6 being operable to provide steam and heat sanitized water;

7 a sanitized water delivery line in fluid communication with the
8 reservoir;

9 a steam delivery line in fluid communication with the boiler;
10 and

- 11 a diverter valve in fluid communication with the sanitized water
12 delivery line, the steam, delivery line, and with the fluid delivery line;
13 said diverter valve being operable to selectively establish fluid
14 communication between the fluid delivery line and the steam delivery
15 line or the fluid delivery line and the sanitized water delivery line;
- 16 B. introducing water into said boiler through said water inlet;
- 17 C. operating said boiler so as to generate steam and heat sanitized
18 water; and
- 19 D. selectably operating said diverter valve so as to deliver heat
20 sanitized water from said boiler to said fluid delivery line, or to deliver steam
21 from said boiler to said fluid delivery line whereby said steam functions to
22 remove biofilm from said fluid delivery line.